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Incorporating Couples-Based Approaches into HIV Prevention for Gay and Bisexual Men: Opportunities and Challenges

David W. Purcell,

Division of HIV/AIDS Prevention (MS D-21), Centers for Disease Prevention and Control, 1600 Clifton Road, Atlanta, GA 30333, USA

Yuko Mizuno,

Division of HIV/AIDS Prevention (MS D-21), Centers for Disease Prevention and Control, 1600 Clifton Road, Atlanta, GA 30333, USA

Dawn K. Smith,

Division of HIV/AIDS Prevention (MS D-21), Centers for Disease Prevention and Control, 1600 Clifton Road, Atlanta, GA 30333, USA

Kristina Grabbe,

Division of HIV/AIDS Prevention (MS D-21), Centers for Disease Prevention and Control, 1600 Clifton Road, Atlanta, GA 30333, USA

Cari Courtenay-Quirk,

Division of Global HIV/AIDS, Centers for Disease Prevention and Control, Atlanta, GA, USA

Hank Tomlinson, and

Division of HIV/AIDS Prevention (MS D-21), Centers for Disease Prevention and Control, 1600 Clifton Road, Atlanta, GA 30333, USA

Jonathan Mermin

National Center for HIV, Viral Hepatitis, STD, and TB Prevention, Centers for Disease Prevention and Control, Atlanta, GA, USA

Abstract

Thirty years after the beginning of the HIV epidemic, gay, bisexual, and other men who have sex with men (collectively called MSM) bear a disproportionate burden of HIV in the United States and continue to acquire a distressingly high number and proportion of new infections. Historically, HIV prevention for MSM has been focused on individual-level behavior change, rarely intervening with MSM as part of a couple. Yet, an estimated 33–67% of HIV infections among MSM are acquired from primary sexual partners, suggesting that work with MSM as couples could be an important contributor to prevention. Given the emergence of high impact combination HIV prevention, it is timely to consider how work with the broad variety of male couples can improve both personal and community health. Couples HIV testing and counseling for MSM is an important advance for identifying men who are unaware that they are HIV-positive, identifying HIV-discordant couples, and supporting men who want to learn their HIV status with their partner.

Once men know their HIV status, new advances in biomedical prevention, which can dramatically reduce risk of HIV transmission or acquisition, allow men to make prevention decisions that can protect themselves and their partners. This paper highlights the present-day challenges and benefits of using a couples-based approach with MSM in the era of combination prevention to increase knowledge of HIV status, increase identification of HIV discordant couples to improve targeting prevention services, and support mutual disclosure of HIV status.

Keywords

HIV; Men who have sex with men; Couples counseling; Gay; Bisexual; Sexual orientation

Introduction

Gay, bisexual, and other men who have sex with men (collectively called MSM) are the group most severely affected by HIV. While MSM represent approximately 2 % of the population in the United States (Purcell et al., 2012), in 2010 they accounted for 63 % of estimated new HIV infections (66 % if MSM who also injected drugs are included) (Centers for Disease Control and Prevention [CDC], 2012b). Even more striking, in 2010, young MSM (ages 13–24) accounted for 72 % of infections in that age group and 30 % of infections among MSM (CDC, 2012b). At the end of 2010, MSM accounted for an estimated 50 % of all persons living with HIV infection in the United States (56 % if MSM who also injected drugs are included) (CDC, 2013). This disparity is best captured in disease rates, which indicate that MSM had an estimated rate of diagnoses of HIV infection in 2008 at least 59 times that of other men and more than 52 times that of women (Purcell et al., 2012). Because of the very high prevalence of HIV and high rates of unidentified infection among MSM (CDC, 2010), the proportion of HIV discordant couples among MSM is higher than among other groups.

The ongoing HIV epidemic among MSM has led public health professionals, researchers, and the gay male community to try to identify the best prevention approaches to reduce HIV transmission among this population. Without decreasing HIV transmission among MSM, the goals of the National HIV/AIDS Prevention Strategy, released by President Obama in July 2010, cannot realistically be met (The White House Office of National AIDS Policy, 2010). The recent advances in biomedical prevention have led to optimism that an AIDS-free generation can be achieved and spurred a formal “Declaration to End HIV/AIDS in America” (National Minority AIDS Council, 2012). There is broad agreement that reducing HIV among MSM will require a “combination” prevention approach (Kurth, Celum, Baeten, Vermund, & Wasserheit, 2010) that integrates the best behavioral and biomedical advances and knowledge in such a way as to provide high-impact prevention to specific groups, including MSM, that are most disproportionately affected by HIV (CDC, 2011a).

Historically, HIV prevention interventions and strategies for MSM have been individually focused (Chakravarty, Hoff, Neilands, & Darbes, 2012), whether delivered at the individual, group, or community level. In this model, decisions about sexual behavior for MSM are framed around individual autonomy and freedom to make personal sexual decisions.

However, most MSM are, will be or have been part of a partnership where they consider themselves a “couple.”

Male couples share many similarities to heterosexual and lesbian couples, but there are also important differences that are relevant for HIV prevention (Brady, Iantaffi, Galos, & Rosser, 2013; Green & Mitchell, 2008). Although the landscape is changing, male couples have historically lacked societal support for their relationships, which means that the usual relationship expectations for heterosexual couples (monogamy, combined finances, mutual inheritance, etc.) do not necessarily apply unless explicitly discussed or implicitly adopted (Green & Mitchell, 2008). The vast majority of male couples make agreements on their own about a variety of issues, including setting parameters on sexual behavior within and outside their relationship (Gass, Hoff, Stephenson, & Sullivan, 2012; Hoff et al., 2009). MSM report a variety of sexual agreements within their primary relationships, including monogamy (permanent or periodic), allowing outside sexual partners (only when together or when either partner is alone with another partner) or agreeing not to ask about outside partners (Brady et al., 2013; Hoff & Beougher, 2010; Parsons, Starks, Gamarel, & Grov, 2012). While these patterns are also observed in heterosexual couples, gay communities have incorporated acceptance of different arrangements into community norms (Brady et al., 2013). Most samples of MSM recruited for research report that at least half of men in primary relationships have an open relationship, although the definition of what “open” means varies widely as described above (Parsons, Starks, DeBois, Grov, & Golub, 2013).

For a variety of reasons, including trust and a desire for intimacy, many studies show that men are more likely to engage in unprotected sex with their primary male partners than with casual partners (Sullivan, Salazar, Buchbinder, & Sanchez, 2009). The shift of a partner from “casual” to “primary” is not a bright line and is defined by the men in the relationship. This shift is an important time for risk because men may stop using condoms once they consider the relationship significant, even in the absence of recent HIV testing or knowledge about the partner’s HIV status. Younger men have higher partner turnover and may consider their relationships to be significant very quickly, leading to risk with potentially multiple significant partners in a relatively short time. In a study of men with steady partners, 55% reported unprotected anal sex within the first three months of the relationship and 46 % did not discuss it before it occurred (Davidovich, de Wit, & Stroebe, 2004b). Research in the Netherlands, Peru, and the U.S. indicate that a substantial proportion of HIV infection among MSM is attributable to primary partners (Davidovich et al., 2004a; Goodreau et al., 2012; Sullivan et al., 2009). A recent U.S. modeling study estimated that 68 % of infections among MSM (95 % CI: 58– 78 %) may be attributable to primary partners (Sullivan et al., 2009). Using different data (from the U.S. and Peru) and a more complex model, another team estimated that from 32 to 39 % of infections among MSM occurred in main partnerships (Goodreau et al., 2012). In light of these results, it has been hypothesized that gay couples may have more difficulties managing HIV risk with primary partners than with casual partners and that prevention strategies must better account for relationship context to be successful (Chakravarty et al., 2012).

In light of the new biomedical advances that are dependent on HIV status, and in the era of combination prevention, the purpose of this article is to re-examine HIV prevention for

MSM in the United States by focusing at the dyadic or couple level. We believe that this approach has been underutilized in HIV prevention and could be an important contributor to high-impact prevention (CDC, 2011a).

HIV Prevention Activities for MSM Couples

To understand more about couples-based prevention approaches for MSM, we will first examine a new approach for couples-based HIV screening, which serves as an entry point for follow-up HIV prevention and care for couples. We will then examine three biomedical advances and their relevance for male couples and then review behavioral approaches. Each of these approaches is important to consider in developing high impact combination prevention for male couples and gay male communities.

Couples HIV Testing and Counseling (CHTC)

HIV testing has long been a key component of HIV control efforts in the United States and it is often considered the gateway to other HIV prevention and care services targeted to individuals based on knowledge of HIV status. Although HIV risk-reduction counseling conducted as part of HIV testing may include discussion about partner's HIV status and the importance of disclosure, services have historically been offered to individuals alone and partner services are utilized after testing for confidentially contacting partners who may be at risk of exposure from a person who tests HIV-positive (CDC, 2006a). HIV testing guidelines have strong emphasis on confidentiality of test results and the inability of providers to disclose someone's results without their permission (CDC, 2006a), which has contributed to the idea that testing is an individual service and that no one—not even a sexual partner—should be permitted to hear someone else's test results at the time they are delivered. Male couples who have sought testing services together have been surprised when this service is unavailable, even with joint consent, due to the prioritization of individual confidentiality (Stephenson et al., 2011).

By definition, CHTC occurs when two persons who are in, or are planning to be in, a sexual relationship receive HIV testing together (World Health Organization [WHO], 2012). This approach follows a similar approach to individual HIV testing; however there are key differences in working with couples that necessitate training and support for providers delivering this service. In a CHTC session, risk discussion is facilitated by encouraging both partners to use non-specific language about partners and risk, rather than conducting individual risk assessments based on specific past risk. This approach reduces the potential for unexpected disclosures in the counseling session and is designed to minimize potential volatility. Test results are delivered to the couple together and counseling messages are based on the results of both partners (concordant HIV-negative, concordant HIV-positive or discordant HIV status) using a future-focused approach. Providers also use the opportunity to explore the couple's agreements about sex outside the relationship.

In sub-Saharan Africa, decades of research on CHTC has demonstrated increased condom use, reduction in sex with outside partners, and reduced HIV transmission among heterosexual discordant couples (Allen et al., 1992, 2003; Fideli et al., 2001; Hira et al., 1990; Kamenga et al., 1991; The Voluntary HIV-1 Counseling and Testing Efficacy Study

Group, 2000). Modeling has suggested that providing CHTC to cohabiting couples in sub-Saharan Africa could avert 35.7–78.8 % of heterosexually transmitted infections that would otherwise occur (Dunkle et al., 2008). Additionally, studies suggest better uptake of HIV testing, improved adherence to prevention of mother-to-child transmission (PMTCT) recommendations, and acceptance of antiretroviral treatment among pregnant women and their male partners receiving CHTC as part of PMTCT interventions, compared to women receiving PMTCT alone (Becker, Mlay, Schwandt, & Lyamuya, 2010; Desgrees Du Lou et al., 2009; Farquhar et al., 2004; Kizito et al., 2008). While the context of PMTCT is different than CHTC, the benefits of working with couples together in PMTCT suggests further exploration of potential benefits of counseling the members of male couples together.

Given the evidence and experience from research and implementation in sub-Saharan Africa, CHTC was recently adapted and introduced for MSM in the U.S. Formative work has demonstrated that, with appropriate adaptations, CHTC with MSM in the U.S. is both acceptable and feasible (Stephenson et al., 2011; Wagenaar et al., 2012). This brief, structured HIV prevention approach could be a key foundation for a comprehensive HIV prevention, care, and treatment package for male couples because it facilitates case finding, assists with mutual disclosure of HIV status and discussion of sexual agreements among male couples, facilitates linkage to care and treatment, supports medication adherence and retention in care, and provides a platform for HIV prevention counseling around condom use, various biomedical interventions (see below), and other emerging HIV prevention technologies. CHTC is particularly important because research shows that HIV-negative male couples get tested at rates lower than the general MSM population, even after potential exposure to HIV (Chakravarty et al., 2012). Discussion of agreements is also an important part of CHTC because, even though most MSM report having an agreement, a substantial proportion also report discrepant understandings of their agreements, which contributes to risk within the couple (Hoff et al., 2009). One goal of CHTC for male couples is that the partners leave with a shared understanding of HIV risk and their sexual agreements and they are linked to appropriate follow-up services based on their test results. Recent research in the U.S. found that MSM who received CHTC reported less unprotected anal intercourse, strengthened communication within the relationship, and a sense of validation for the relationship, which may have implications for reducing risky behavior.

Although CHTC for MSM is in the early stages of adoption in the U.S., the CDC is developing a training plan for both community-based and clinic-based HIV testing providers and is engaging health departments and other key partners to develop plans to support practitioners who choose to adopt this approach. HIV testing programs in non-clinical settings may benefit from focusing not only on individual HIV testing, but also on CHTC; similar programs may be considered for inclusion in clinical settings. Targeting young male couples for this service may be a way to socialize them into the importance of HIV testing among MSM and about some of the challenges of staying uninfected, even in a primary relationship. Recent research found that young MSM, men of color, and men with a main sex partner were particularly interested in CHTC (Wagenaar et al., 2012).

Another form of testing with relevance for male couples became available in July 2012 when the Food and Drug Administration (FDA) (2012a) licensed an in-home HIV test for over-

the-counter sale. This test can be purchased online or at a pharmacy for approximately \$40 and it allows a user, in about 20 min, to learn his own HIV status or to engage in a form of “self-directed” couples testing to learn the HIV status of primary or casual partners. Research conducted before FDA approval indicated that HIV-negative gay men who never or rarely used condoms would be willing to use such a test to test themselves and potential sex partners (Carballo-Diéguez, Frasca, Dolezal, & Balan, 2012). Other researchers have hypothesized that the approval of the in-home rapid test could raise some public health challenges and be misused because users (1) may not fully understand the meaning of the test result because of window periods, (2) may use the test as a tool to permit risky behavior with presumed HIV-negative partners, and (3) may not follow up with confirmatory testing after a reactive (presumed-positive) result (Paltiel & Walensky, 2012). The CDC has recently funded the e-STAMP study to explore how often and under what circumstances MSM use such tests.

Biomedical Prevention

Effective HIV prevention with male couples in the U.S. now includes three biomedical strategies based on antiretroviral medication use. One of these HIV prevention strategies is delivered by clinicians in order to reduce transmission from men with HIV infection to their uninfected sexual partners through the prevention benefits of treatment (sometimes called “treatment as prevention” or TasP). The other two are provided to reduce susceptibility to HIV exposure when used by men who do not have HIV infection, either before potential exposure (pre-exposure prophylaxis or PrEP), or shortly after a suspected exposure (non-occupational post-exposure prophylaxis or nPEP) (see Table 1). After describing each of these interventions, we describe how each is relevant for HIV prevention among discordant male couples.

Prevention Benefits of Treatment—A large randomized, placebo-controlled clinical trial was conducted among African heterosexual HIV-discordant couples (HPTN 052) to assess whether providing antiretroviral treatment (ART) to the HIV-infected partner earlier in the course of infection than guidelines recommended at the time would reduce transmission to their uninfected partners (Cohen et al., 2011). The trial showed a 96 % reduction in HIV acquisition among partners of those started on early treatment compared to those not yet eligible for ART. Based on this study, antiretroviral treatment guidelines in the U.S. were recently updated to recommend that ART be provided earlier for the clinical benefit of the infected individual, as well as preventing transmission to their partners (Panel on Antiretroviral Guidelines for Adults and Adolescents [Panel], 2013). The guidelines specifically indicated that ART be offered to HIV-infected persons who are at risk of transmitting HIV to their sexual partners.

The high efficacy of HIV treatment to prevent new infections offers opportunities and challenges for male couples (Smith, Powers, Kashuba, & Cohen, 2011). For example, while effective antiretroviral treatment of HIV-positive partners can be effective in reducing the risk of transmission from them, additional protective measures to reduce susceptibility of the uninfected partner to HIV and other sexually transmitted infections (STIs) may be especially important for couples where the uninfected partner has outside sexual relationships. In

HPTN 052, 7 (18 %) of 38 infections were not genetically linked to the partner's virus, indicating acquisition from a partner outside the couple (Eshleman et al., 2011). Condoms are still recommended for serodiscordant couples even if the HIV-positive partner has a suppressed viral load (Panel, 2013).

Pre-Exposure Prophylaxis (PrEP)—The FDA recently approved the use of daily oral doses of Truvada [300 mg tenofovir disoproxil fumarate (TDF) and 200 mg emtricitabine (FTC)] as preexposure prophylaxis to reduce the risk of sexual HIV acquisition among adults, including MSM (Food and Drug Administration, 2012b). This is currently the only PrEP regimen proven safe and effective for continuous daily use for months to years. A large randomized, placebo-controlled, clinical trial conducted with MSM and transgender women who have sex with men in North and South America, Asia, and Africa (iPrEx) demonstrated the efficacy and safety of PrEP for MSM (Grant et al., 2010)—the overall risk of acquiring HIV infection was 44 % lower among men given Truvada than among those given a placebo pill. Among men who reported taking greater than 90 % of their doses, Truvada® was associated with a 73 % efficacy. Comparing those with TDF detected in blood specimens to those without drug detected, efficacy was 92 %. The most common side effect (10%) was mild nausea for the first few weeks. Applying data on drug levels attained with directly observed dosing to the levels measured in iPrEx and modeling associated efficacy, Anderson et al. (2012) reported that daily Truvada® is “forgiving” of small amounts of non-adherence to daily dosing. Drug levels found with taking all daily doses was associated with 99 % efficacy and for 4 doses per week with 96 % efficacy). While this indicates that missing occasional doses may not compromise efficacy much, drug levels found with taking two doses per week were associated with significantly lower efficacy (76%). Another study among African MSM and sex workers found that adherence was highest in those assigned to daily dosing (83 %) as opposed to twice weekly (55 %) or coitally-dependent dosing (26 %) (Mutua et al., 2012). These two studies suggest that intermittent dosing strategies are unlikely to be as effective as the currently recommended daily dosing and reinforce the need to support adherence.

Based on the results of the iPrEx trial, CDC (2011b) issued interim guidance for its use with MSM in the U.S. that addresses some of the complex issues facing men and their providers in deciding whether and when to use PrEP. PrEP is not yet widely used, but health-care providers in a variety of locations and clinical settings are beginning to consider it or are already prescribing it (Tripathi, Ogbuanu, Monger, Gibson, & Duffus, 2012; White, Mimiaga, Krakower, & Mayer, 2012). Awareness of PrEP is still low among MSM (Krakower et al., 2012; Liu et al., 2008; Mimiaga, Case, Johnson, Safren, & Mayer, 2009) but a substantial proportion of MSM of all races expressed interest in PrEP after the intervention was explained (Barash & Golden, 2010; Mimiaga et al., 2009; Smith, Toledo, Smith, Adams, & Rothenberg, 2012). The recent establishment of a PrEP Medication Assistance Program providing Truvada® at no cost to low-income, uninsured U.S. residents reduces one significant barrier to PrEP use by economically disadvantaged persons (Gilead, 2012).

Non-Occupational Post-Exposure Prophylaxis (nPEP)—Department of Health & Human Services guidelines have recommended nPEP as soon as possible within the 72 h following sexual HIV exposures to prevent HIV infection since 2005 (U.S. Department of Health Human Services, 2005) based on biological plausibility, extrapolation from an early case-control study of PEP for occupational needle stick exposures, and a single observational cohort study in Brazilian MSM (Schechter et al., 2004). In the Schechter et al. study, men who were provided starter packs often did not accurately assess the risk of sexual exposures and initiate nPEP, which limited its efficacy. Despite the 2005 recommendations, there is still limited awareness of (Mitchell, 2012) and access to this intervention (Landovitz, Combs, & Currier, 2009) within the 72-h window following potential HIV exposure. In the context of an HIV-discordant couple, however, where either or both partners may recognize an exposure, and a partner can provide support for medication adherence, nPEP may be a valuable tool that meets occasional needs.

Common Features of HIV Treatment, PrEP, and nPEP Use for HIV-Discordant Male Couples—Because each of these clinically based interventions derive their HIV prevention efficacy from the direct biologic effects of the medications, achieving and sustaining effective drug levels is critical. This is dependent upon men taking the medication as prescribed which is affected by, (1) the attitudes and resulting behaviors of sexual partners, especially those in ongoing, emotionally important relationships such as couples and (2) HIV risk-reduction and medication adherence counseling practices of clinical and non-clinical providers.

Although adherence is key to the effectiveness of any of these antiretroviral prevention methods, little is known about medication adherence among HIV-negative men in HIV-discordant couples because most research has focused on adherence among HIV-positive persons. In a PrEP trial conducted with African heterosexual HIV-discordant couples, high medication adherence was attributed to interpersonal factors, couples relationship counseling, and partner support for medication taking (Ware et al., 2012). This aspect of PrEP was not assessed in the study of attitudes of U.S. MSM in HIV-discordant couples (Brooks et al., 2011,2012). There are eight evidence-based medication adherence interventions identified by CDC's Compendium of Evidence Based Intervention (CDC, 2012a) that are designed for HIV-positive persons being treated with antiretrovirals for their own health. One of these interventions, called SMART couples, was designed for HIV-discordant couples and was found to be modestly effective (Remien et al., 2005). Interventions that are designed for HIV-positive persons, including SMART couples, could be adapted for discordant male couples using PrEP, HIV treatment for its prevention benefits, or both. In addition, there are other counseling and HIV medication adherence support strategies that have been identified that could be adapted for HIV-discordant male couples who are using bio-medical prevention methods (Koenig, Lyles, & Smith, 2013).

As effective biomedical strategies become more widely used, there is mixed evidence about whether the prevention benefits of biomedical strategies could be offset by increases in risky behaviors or decreases in other preventive behaviors (risk compensation) (Grant et al., 2010; Guest et al., 2008; Kalichman, Eaton, & Cherry, 2010). Therefore, prevention counseling interventions are needed for use with biomedical interventions that take this possibility into

account. In this framework, care providers or their staff would first determine the level of adherence to antiretrovirals by either or both partners, the viral load status of the HIV-positive partner, the openness of the sexual relationship for the uninfected partner, and other risk or protective factors for HIV acquisition. Then an assessment could be made of residual risk of acquisition or transmission, which would differ for each individual. Working with a care provider, a couple could gather accurate information that would form a basis for defining insufficiently protected sex and assist in identifying the most acceptable means to further reduce that risk.

STIs are frequently diagnosed in HIV-infected and uninfected MSM. For men with HIV infection, concurrent STIs could reduce the efficacy of treatment, as STIs increase genital HIV shedding despite suppressed blood levels of virus. In one systematic review, the mean point prevalence of STIs among persons with HIV infection was 16 % (Kalichman, Pellowski, & Turner, 2011). Since 2000, rising incidence of gonorrhea and chlamydia infection (Spaulding et al., 2012) as well as syphilis (Ganesa et al., 2012) has been documented among HIV-infected men in a U.S. military cohort. Rates of primary and secondary syphilis have also been rising among MSM in the general population (Su, Beltrami, Zaidi, & Weinstock, 2011) and is associated with increases in HIV diagnoses, especially in young African American MSM (Torrone et al., 2011). In general, STIs increase the likelihood of transmission and acquisition of HIV although a number of complex factors affect the actual likelihood of infection (Bernstein, Marcus, Nieri, Philig, & Klausner, 2010; Buchacz et al., 2008; Cohen et al., 1997; Kelley et al., 2011). Therefore, access to frequent testing and treatment for diagnosed STIs is a critical part of HIV prevention for both partners in MSM couples. CDC (2006a) recommends that persons likely to be at high risk for HIV, including sexually active MSM, be tested for HIV at least annually. CDC (2006b) also recommends that all MSM be tested at least annually for STIs. More frequent HIV and STI testing is recommended for men who have “multiple or anonymous partners, have sex in conjunction with illicit drug use, or whose sex partners participate in these activities”(CDC, 2006b).

Providing clinical and supportive counseling services to couples, each of whom retains the right to privacy of information provided as part of their care, raises special issues about facilitated disclosure and negotiated boundaries. Coordinating biomedical HIV prevention care may be especially complex when each member of a couple obtains health care from a different provider or clinic or with different payment sources. Resolving these issues in HIV prevention and treatment care settings can be informed by experience in the mental health and family/marital counseling areas (Margolin, 1982) as well as in the substance abuse treatment area (Simmons & McMahon, 2012).

Behavioral Prevention

A variety of behavioral approaches has been researched and implemented for MSM during the first 30 years of the AIDS epidemic. First we will examine structured behavioral interventions to reduce sexual risk for male couples and then community-developed HIV prevention approaches that consider the HIV status of partners.

Evidence-Based Behavioral Interventions—Through 2011, CDC's HIV/AIDS Prevention Research Synthesis (PRS) Project identified 74 evidence-based interventions (EBIs) to reduce sexual and injection risk behaviors to be included in CDC's Compendium of HIV Prevention Interventions (CDC, 2012a). Most of these EBIs have focused on increasing condom use or reducing the number of partners. However, there are no EBIs specifically for male couples and one EBI for heterosexual couples (*Connect*) (El-Bassel et al., 2003). Another EBI that specifically targets African American HIV-discordant heterosexual couples (*Eban*) (El-Bassel et al., 2010) has been identified and will be added to the Compendium in 2013. Both couples interventions are theory-based, are delivered to intact intimate couples or groups of couples, and address interpersonal factors such as communication, safer sex negotiation, and problem solving skills. Reviewing studies that assessed behavioral interventions for heterosexual couples, Pequegnat and Bray (2012) concluded that couples interventions are more efficacious than traditional individual-level HIV prevention interventions in promoting condom use among HIV-discordant couples and preventing new cases of HIV.

Although no EBI for male couples has been identified, preliminary evidence of efficacy and feasibility of this approach was reported by Wu et al. (2011), who adapted *Connect* for use with methamphetamine-using, Black male couples and pilot tested the intervention with 34 MSM couples using a pre-post design. *Connect with Pride* is a seven-session (90 min each) intervention, delivered to a male couple by a facilitator who addresses issues specific to couples, such as communication, joint problem-solving, and condom negotiation. The intervention also acknowledges potential risk reduction strategies, such as serosorting (the practice of making choices about sex partners or sexual practices based on the HIV infection status of both partners) and seropositioning (having an HIV-negative partner take the less risky role such as insertive rather than receptive position for anal sex). At follow-up, participants of the pilot study reported significant reduction in HIV sexual risk and drug using behaviors, including methamphetamine use and 82 % of the enrolled couples attended all sessions, demonstrating the feasibility of retaining high-risk male couples in a relatively intensive behavioral intervention. Wu et al.'s study showed the promise of a couples-based approach for MSM; however, evidence of efficacy needs to be demonstrated with a more rigorous study design.

Even when the efficacy of couples-based interventions for MSM is established, it is not feasible or appropriate for all male couples to attend this type of intervention. Couples interventions are relatively labor intensive and potentially high cost, making them potentially difficult to disseminate widely and reach a large number of couples. For example, the two EBIs for heterosexual couples and *Connect with Pride* consist of six to eight sessions and need to be delivered by skilled facilitators who can manage couples dynamics. Couple-based behavioral interventions may be most appropriate for MSM who are at very high risk for HIV infection/transmission, such as serodiscordant couples. Such interventions would be additionally beneficial if they addressed the availability of biomedical interventions and address couples' questions on risk reduction when using both behavioral and biomedical approaches. In addition, as discussed above, brief provider-delivered interventions may be appropriate for men trying to use biomedical interventions to reduce risk.

Community-Developed HIV Prevention Strategies Focused on HIV Status—In

addition to the EBIs, there is a group of untested HIV prevention strategies that have emerged from the community and received widespread interest from community members, researchers, and public health professionals. The term “seroadaptation” is used to describe a broad range of strategies that include serosorting and seropositioning, which are intended to decrease the risk of acquiring or transmitting HIV by considering the HIV status of the partner. In December 2008, the CDC sponsored a consultation on serosorting practices among 3MSM (CDC, 2009) and published a statement highlighting limitations of serosorting as a risk-reduction strategy (CDC, 2011c). The World Health Organization (WHO, 2011) came to a similar conclusion for HIV-negative MSM and transgender persons. The WHO published the following conclusions and provided the strength of evidence for their recommendations: (1) consistent condoms use is strongly recommended over serosorting (*strong recommendation, very low quality of evidence*) and (2) serosorting is suggested over not using condoms under specific circumstances as a risk-reduction strategy (*conditional recommendation, very low quality of evidence*). The WHO also noted that people who use serosorting as a risk-reduction strategy need to be screened regularly for HIV and STIs.

There are significant challenges for couples who want to use serosorting, particularly the difficulty of ascertaining and maintaining accurate knowledge of their own and their partner’s HIV status if they are not consistently monogamous (Parsons et al., 2006; Zablotska et al., 2009). In a new relationship, factors such as HIV testing patterns, unrecognized infection, and recent HIV infection all play a role in whether men have accurate knowledge (CDC, 2010; Pitcher et al., 2004). Successful serosorting for HIV-negative men is hampered by the difficulties that many men have in discussing their HIV status and by the guesses and assumptions men may make to avoid these conversations (Eaton, Kalichman, O’Connell, & Karchner, 2009). In addition, HIV status and risk behavior may change over time for a couple whereas decisions about sexual behavior are often negotiated early in the relationship. The FDA’s recent approval of an over-the-counter rapid test may facilitate the ability for couples to serosort although the 3-month window period for the test means that men who were recently sexually active cannot be certain of their HIV status from one test or rely on results immediately (Paltiel & Walensky, 2012).

Despite the challenges, there is interest in serosorting because data indicate that, although offering less protection than condoms, serosorting may provide some protection from contracting HIV when compared with sexual behaviors enacted without consideration of partners’ HIV status. For example, in a study of self-reported HIV-negative black and Latino MSM in the U.S. (Marks et al., 2010), men who serosorted (i.e., only had unprotected anal sex with other men perceived as HIV-negative) were less likely to have unrecognized HIV infection compared with men who did not limit their unprotected anal sex to partners perceived as HIV-negative (4.4 vs. 11.5 %). However, men who serosorted were more likely to be infected than were men who said that they always used a condom during anal sex (4.4 vs. 2.7 %). Other studies have obtained similar results in samples comprised mostly of white MSM (Golden, Stekler, Hughes, & Wood, 2008; Jin et al., 2009). In contrast, a recent study in Seattle found a partially protective effect for white MSM, but no protective effect of

serosorting for African American MSM, as 42 % of newly diagnosed infections among African Americans were among men classified as serosorters (Golden, Dombrowski, Kerani, & Stekler, 2012). Numbers of new infections were small in all of these studies, which may explain different results. Golden et al. (2012) hypothesized that the lack of protection of serosorting for African American MSM may be due to high rates of infected men who do know their HIV status and the tendency for men to choose partners of the same race.

In Australia, a particular form of enhanced serosorting, called negotiated safety, was established early in the HIV epidemic to help HIV-negative MSM enter into and maintain sero-concordant relationships (Kippax, Connell, Dowsett, & Crawford, 1993; Kippax et al., 1997). In negotiated safety, HIV-negative couples restrict unprotected anal intercourse (UAI) to each other and agree about sex outside of the regular relationship (Jin et al., 2009; Kippax et al., 1993, 1997). Important elements of negotiated safety include: (1) a primary relationship, (2) the relationship being established for at least 6 months, (3) shared knowledge of HIV-negative status supported by two HIV tests separated in time, and (4) a clear, spoken agreement about the types of sex allowed inside and outside of the relationship (usually no AI or no UAI outside the relationship) (Kippax, 2002). Only after all of these elements are successfully navigated are primary partners able to remove condoms.

Early research on the efficacy of negotiated safety suggested some protection (Crawford, Rodden, Kippax, & Van de Ven, 2001; Kippax et al., 1997), but research has consistently found a significant number of broken agreements (ranging from 10 to 40 %) (Hoff, 2005; Hoff et al., 2009). In fact, one of the most common reasons for recent seroconversion among MSM in Australia was a breakdown of a negotiated safety agreement (Kippax et al., 2003). A recent longitudinal study of 566 MSM couples provided details about the content of agreements between MSM couples and found that nearly all men who reported a primary partner reported an agreement about the permissibility and conduct of sex outside the relationship (Hoff et al., 2009). Among couples in which both men were HIV-negative ($N = 88$ couples), 56 % of the couples had an agreement to be monogamous, 42 % had an agreement about outside partners with some restrictions, and 2% had an open relationship with no restrictions. Consistent with prior research, 31 % of men reported that they had broken their agreement in the previous 12 months and 55 % of these men did not disclose the breach (Hoff et al., 2009). HIV prevention was often not the primary motivator for the agreement, with restrictions focused on issues such as safer sex, location of sex with outside partners or that both partners participate together in outside activities (Hoff, 2005; Hoff et al., 2009). In addition, many agreements were vague or avoided explicit discussion of what was acceptable or considered safe, which left opportunities for misunderstandings and broken agreements (Hoff et al., 2009). Other data have also shown misunderstanding about the meaning of monogamy for male couples, with substantial numbers of men in “monogamous” relationships reporting outside partners (Brady et al., 2013; Hoff & Beougher, 2010). Because a successful negotiated safety agreement has many elements, some men may not be able to adopt all the elements that increase the likelihood of success (Guzman et al., 2005). Among London male couples, many had adopted part of negotiated safety (anal sex only with main partner) but many had not established that they had the same HIV status, a crucial step in negotiated safety (Elford, Bolding, Maguire, & Sherr, 1999).

Negotiated safety, if properly implemented, could be an important strategy to reduce HIV transmissions between HIV-discordant primary partners, even though their safety agreements can be even more complex (Beougher et al., 2012). The overall efficacy of negotiated safety for HIV-negative men at a population level is supported by data from Jin et al. (2009) who found that compared to HIV-negative men who reported no UAI, the risk of HIV infection was not raised by men who engaged in UAI with primary partners and reported following the tenets of negotiated safety. However, men who engaged in UAI and reported serosorting as their risk-reduction strategy were three times as likely to become HIV infected than men who reported negotiated safety. Agreements are already so common among MSM in steady relationships that they are a natural place to target prevention interventions based on negotiated safety. For negotiated safety to be successful, it is important that agreements are clear and explicit, that the potential for failure is discussed, that they are updated regularly, that breaches are disclosed, and that broken agreements are renegotiated and include re-testing for HIV and STIs (Guzman et al., 2005). Because agreements are so common, but also fraught with challenges, more research on how to support agreements among male couples is urgently needed. Understanding and negotiating successfully may be particularly difficult for some men (e.g., young men who are newer to same-sex relationships, previously abused men, substance abusing men). Recent data indicate that HIV-specific partner-provided support predicted reduced unprotected anal sex among HIV-negative couples with outside partners, whereas general partner-provided social support was associated with increased risk, indicating that interventions might target enhancing support specifically around HIV (Darbes, Chakravarty, Beougher, Neilands, & Hoff, 2012).

Conclusions

HIV prevention efforts for gay and bisexual men in the U.S. could benefit from more research and development of couples-based interventions designed specifically for male couples. While some interventions can be adapted from existing models, we also need research to identify what specifically works for male couples and what makes the biggest impact on HIV among MSM in the most cost effective manner. To reduce HIV infections among MSM, it is important to address not only individual-level risk among MSM, but risk specifically in the context of primary relationships in all their variety. Couples HTC is a successful method for identifying HIV-positive persons who were previously unaware of their serostatus, identifying serodiscordant couples in need of more targeted biomedical and behavioral prevention services, and for facilitating mutual disclosure of serostatus between partners. CHTC could provide an entrée for male couples into HIV prevention activities by focusing on the couple's decision to get tested together as a show of commitment to the relationship and taking care of each other. CHTC allows for discussions about monogamy, outside partners, and rules around sexual expression with each other and other partners. It also allows a couple to choose to follow the tenets of negotiated safety, and provides an opportunity to provide more targeted prevention messages and services in the context of serodiscordant partnerships. New biomedical advances give couples more prevention tools to use, but achieving and sustaining effective drug levels is critical and depends on adherence, attitudes and behaviors of partners, and counseling support from clinical and non-clinical

providers. More in-depth behavioral support for prevention should be provided for MSM most likely to acquire or transmit HIV. But intervention development for gay male couples is in its infancy. Thus, as these approaches are launched in the U.S., we also need more research and evaluation to understand how to best work with male couples given all the complex messages and decisions that accompany combination, high-impact prevention.

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References

- Allen S, Meinen-Derr J, Kautzman M, Zulu I, Trask S, Fideli U, Haworth A. Sexual behavior of HIV discordant couples after HIV counseling and testing. *AIDS*. 2003; 17:733–740. [PubMed: 12646797]
- Allen S, Tice J, Van de Perre P, Serufilira A, Hudes E, Nsengumuremyi F, Hulley S. Effect of serotesting with counseling on condom use and seroconversion among HIV discordant couples in Africa. *British Medical Journal*. 1992; 304:1605–1609. [PubMed: 1628088]
- Anderson PL, Glidden DV, Liu A, Buchbinder S, Lama JR, Guanira JV. iPrEx Study Team. Emtricitabine-tenofovir concentrations and pre-exposure prophylaxis efficacy in men who have sex with men. *Science Translational Medicine*. 2012; 4(151):151ra125.
- Barash EA, Golden M. Awareness and use of HIV pre-exposure prophylaxis among attendees of a Seattle gay pride event and sexually transmitted disease clinic. *AIDS Patient Care and STDs*. 2010; 24:689–691. [PubMed: 20863247]
- Becker S, Mlay R, Schwandt HM, Lyamuya E. Comparing couples' and individual voluntary counseling and testing for HIV at antenatal clinics in Tanzania: A randomized trial. *AIDS and Behavior*. 2010; 14:558–566. [PubMed: 19763813]
- Beougher SC, Chakravarty D, Garcia CC, Darbes LA, Neilands TB, Hoff CC. Risks worth taking: Safety agreements among discordant gay couples. *AIDS Care*. 2012; 24:1071–1077. [PubMed: 22292838]
- Bernstein KT, Marcus JL, Nieri G, Philip SS, Klausner JD. Rectal gonorrhea and chlamydia reinfection is associated with increased risk of HIV seroconversion. *Journal of Acquired Immune Deficiency Syndromes*. 2010; 53:537–543. [PubMed: 19935075]
- Brady SS, Iantaffi A, Galos DL, Rosser BRS. Open, closed, or in between: Relationship configuration and condom use among men who use the internet to seek sex with men. *AIDS and Behavior*. 2013; 17:1499–1514. [PubMed: 23008123]
- Brooks RA, Kaplan RL, Lieber E, Landovitz RJ, Lee SJ, Leibowitz AA. Motivators, concerns, and barriers to adoption of preexposure prophylaxis for HIV prevention among gay and bisexual men in HIV-serodiscordant male relationships. *AIDS Care*. 2011; 23:1136–1145. [PubMed: 21476147]
- Brooks RA, Landovitz RJ, Kaplan RL, Lieber E, Lee SJ, Barkley TW. Sexual risk behaviors and acceptability of HIV pre-exposure prophylaxis among HIV-negative gay and bisexual men in serodiscordant relationships: A mixed methods study. *AIDS Patient Care STDs*. 2012; 26:87–94. [PubMed: 22149764]
- Buchacz K, Klausner JD, Kerndt PR, Shouse RL, Onorato I, McElroy PD, Brooks JT. HIV incidence among men diagnosed with early syphilis in Atlanta, San Francisco, and Los Angeles, 2004 to 2005. *Journal of Acquired Immune Deficiency Syndromes*. 2008; 47:234–240. [PubMed: 18340654]
- Carballo-Diéguez A, Frasca T, Dolezal C, Balan I. Will gay and bisexually active men at high risk of infection use over-the-counter rapid HIV tests to screen sexual partners? *Journal of Sex Research*. 2012; 49:379–387. [PubMed: 22293029]

- Centers for Disease Control and Prevention. Revised recommendations for HIV testing of adults, adolescents, and pregnant women in health care settings, Morbidity and Mortality Weekly Report. 2006a; 55(RR17):1–17.
- Centers for Disease Control and Prevention. Sexually transmitted diseases treatment guidelines, Morbidity and Mortality Weekly Report. 2006b; 55(RR11):9–10.
- Centers for Disease Control and Prevention. Meeting summary: “Consultation on serosorting practices among men who have sex with men.”. 2009. Retrieved from <http://www.cdc.gov/hiv/topics/research/resources/other/serosorting.htm>
- Centers for Disease Control and Prevention. Prevalence and awareness of HIV Infection among men who have sex with men—21 cities, United States, 2008. Morbidity and Mortality Weekly Report. 2010; 59:1201–1207. [PubMed: 20864920]
- Centers for Disease Control and Prevention. High-impact HIV prevention: CDC’s approach to reducing HIV infections in the United States. 2011a. Retrieved from http://www.cdc.gov/hiv/strategy/dhap/pdf/nhas_booklet.pdf
- Centers for Disease Control and Prevention. Interim guidance: preexposure prophylaxis for the prevention of HIV infection in men who have sex with men. Morbidity and Mortality Weekly Report. 2011b; 60(3):65–68.
- Centers for Disease Control and Prevention. Serosorting among gay, bisexual, and other men who have sex with men. 2011c. Retrieved from <http://www.cdc.gov/msmhealth/Serosorting.htm>
- Centers for Disease Control and Prevention. Compendium of Evidence-Based HIV Behavioral Interventions. 2012a. Retrieved from <http://www.cdc.gov/hiv/topics/research/prs/index.htm>
- Centers for Disease Control and Prevention. Estimated HIV incidence among adults and adolescents in the United States, 2007–2010. HIV Surveillance Supplemental Report. 2012b; 17(4) Retrieved from http://www.cdc.gov/hiv/surveillance/resources/reports/2010supp_vol17no4/index.htm.
- Centers for Disease Control and Prevention. Diagnoses of HIV infection in the United States and dependent areas, 2011. HIV Surveillance Report. 2013; 23 Retrieved from <http://www.cdc.gov/hiv/surveillance/resources/reports/2011report/index.htm>.
- Chakravarty D, Hoff CC, Neilands TB, Darbes LA. Rates of testing in the presence of serodiscordant UAI among HIV-negative gay men in committed relationships. AIDS and Behavior. 2012; 16:1944–1948. [PubMed: 22460227]
- Cohen MS, Chen YQ, McCauley M, Gamble T, Hosseinipour MC, Kumarasamy N, HPTN052 Study Team. Prevention of HIV-1 infection with early antiretroviral therapy. New England Journal of Medicine. 2011; 365:493–505. [PubMed: 21767103]
- Cohen MS, Hoffman IF, Royce RA, Kazembe P, Dyer JR, Daly CC, Eron JJ. Reduction of concentration of HIV-1 in semen after treatment of urethritis: Implications for prevention of sexual transmission of HIV-1. Lancet. 1997; 349:1868–1873. [PubMed: 9217758]
- Crawford JM, Rodden P, Kippax S, Van de Ven P. Negotiated safety and other agreements between men in relationships: Risk practice redefined. International Journal of STD and AIDS. 2001; 12:164–170. [PubMed: 11231869]
- Darbes LA, Chakravarty D, Beougher SC, Neilands TB, Hoff CC. Partner-provided social support influences choice of risk reduction strategies in gay male couples. AIDS and Behavior. 2012; 16:159–167. [PubMed: 21221756]
- Davidovich U, de Wit JBF, Albrecht N, Geskus R, Stroebe W, Coutinho R. Increase in the share of steady partners as a source of HIV infection—A 17-year study of seroconversion among younger and older gay men. AIDS. 2004a; 15:1303–1308.
- Davidovich U, de Wit JBF, Stroebe W. Behavioral and cognitive barriers to safer sex between men in steady relationships: Implications for prevention strategies. AIDS Education and Prevention. 2004b; 16:304–314. [PubMed: 15342333]
- Desgrees Du Lou A, Brou H, Traore AT, Djohan G, Becquet R, Leroy V. From prenatal HIV testing of the mother to prevention of sexual HIV transmission within the couple. Social Science and Medicine. 2009; 69:892–899. [PubMed: 19552991]
- Dunkle KL, Stephenson R, Karita E, Chomba E, Kayitenkore K, Vwalika C, Allen S. New heterosexually transmitted HIV infections in married or cohabiting couples in urban Zambia and

- Rwanda: an analysis of survey and clinical data. *Lancet*. 2008; 371:2183–2191. [PubMed: 18586173]
- Eaton LA, Kalichman SC, O'Connell DA, Karchner WD. A strategy for selecting sexual partners believed to pose little/no risks for HIV: Serosorting and its implications for HIV transmission. *AIDS Care*. 2009; 21:1279–1288. [PubMed: 20024704]
- El-Bassel N, Jemmott JB, Landis R, Pequegnat W, Wingood GM, Wyatt GE. for the NIMH Multisite HIV/STD Prevention Trial for African American Couples Group. National Institute of Mental Health Multisite Eban HIV/STD Prevention Intervention for African American HIV Serodiscordant Couples. *Archives of Internal Medicine*. 2010; 170:1594–1601. [PubMed: 20625011]
- El-Bassel N, Witte SS, Gilbert L, Wu E, Chang M, Hill J, et al. The efficacy of a relationship-based HIV/STD prevention intervention program for heterosexual couples. *American Journal of Public Health*. 2003; 93:963–969. [PubMed: 12773363]
- Elford J, Bolding G, Maguire M, Sherr L. Sexual risk behavior among gay men in a relationship. *AIDS*. 1999; 13:1407–1411. [PubMed: 10449295]
- Eshleman SH, Hudelson SE, Redd AD, Wang L, Debes R, Chen YQ, Hughes JP. Analysis of genetic linkage of HIV from couples enrolled in the HIV Prevention Trials Network 052 Trial. *Journal of Infectious Diseases*. 2011; 204:1918–1926. [PubMed: 21990420]
- Farquhar C, Kiarie JN, Richardson BA, Kabura MN, John FN, Nduati RW, John-Steward GC. Antenatal couple counseling increases uptake of interventions to prevent HIV-1 transmission. *Journal of Acquired Immune Deficiency Syndromes*. 2004; 37:1620–1026. [PubMed: 15577420]
- Fideli US, Allen SA, Musonda R, Trask S, Hahn BH, Weiss H, Aldrovandi GM. Virologic and immunologic determinants of heterosexual transmission of human immunodeficiency virus type 1 in Africa. *AIDS Research and Human Retroviruses*. 2001; 17:901–910. [PubMed: 11461676]
- Food and Drug Administration. Truvada approved to reduce the risk of sexually transmitted HIV in people who are not infected with the virus. 2012a. Retrieved from <http://www.fda.gov/ForConsumers/ByAudience/ForPatientAdvocates/HIVandAIDSActivities/ucm312264.htm>
- Food and Drug Administration. FDA approves first over-the-counter home-use rapid HIV test [Press release]. 2012b. Retrieved from <http://www.fda.gov/NewsEvents/Newsroom/PressAnnouncements/ucm310542.htm>
- Ganesa A, Fieberg A, Agan BK, Lalani T, Landrum ML, Wortmann G. The Infectious Disease Clinical Research Program HIV Working Group. Results of a 25-year longitudinal analysis of the serologic incidence of syphilis in a cohort of HIV-infected patients with unrestricted access to care. *Sexually Transmitted Diseases*. 2012; 39:440–448. [PubMed: 22592829]
- Gass K, Hoff CC, Stephenson R, Sullivan PS. Sexual agreements in partnerships of internet-using men who have sex with men. *AIDS Care*. 2012; 24:1255–1263. [PubMed: 22375729]
- Gilead. Truvada medication assistance program. 2012. Retrieved from http://www.gilead.com/truvada_assistance_program
- Golden MR, Dombrowski JC, Kerani RP, Stekler JD. Failure of serosorting to protect African American men who have sex with men from HIV infection. *Sexually Transmitted Diseases*. 2012; 39:659–664. [PubMed: 22902660]
- Golden MR, Stekler J, Hughes JP, Wood RW. HIV serosorting in men who have sex with men: Is it safe? *Journal of Acquired Immune Deficiency Syndrome*. 2008; 49:212–218.
- Goodreau SM, Carnegie NB, Vittinghof E, Lama JR, Sanchez J, Grinsztejn B, Buchbinder SP. What drives the US and Peruvian HIV epidemic in men who have sex with men (MSM)? *PLoS One*. 2012; 7(11):e50522. [PubMed: 23209768]
- Grant RM, Lama JR, Anderson PL, McMahan V, Liu AY, Vargas L, et al. Preexposure chemoprophylaxis for HIV prevention in men who have sex with men. *New England Journal of Medicine*. 2010; 363:2587–2599. [PubMed: 21091279]
- Green, R-J.; Mitchell, V. Gay and lesbian couples in therapy: Minority stress, relational ambiguity, and families of choice. In: Gurman, AS., editor. *Clinical handbook of couple therapy*. 4th. New York: Guilford Press; 2008. p. 662-680.

- Guest G, Shattuck D, Johnson L, Akumatey B, Clarke EEK, Chen PL, et al. Changes in sexual risk behavior among participants in a PrEP HIV prevention trial. *Sexually Transmitted Diseases*. 2008; 35:1002–1008. [PubMed: 19051397]
- Guzman R, Colfax GN, Wheeler S, Mansergh G, Marks G, Rader M, et al. Negotiated safety relationships and sexual behavior among a diverse sample of HIV-negative men who have sex with men. *Journal of Acquired Immune Deficiency Syndromes*. 2005; 38:33–42.
- Hira SK, Nkowane BM, Kamanga J, Wadhawan D, Kavindele D, Macuacua R, Perine PL. Epidemiology of human immunodeficiency virus in families in Lusaka, Zambia. *Journal of Acquired Immune Deficiency Syndrome*. 1990; 3:83–86.
- Hoff C. Negotiated safety agreements: Do they protect and how they protect. *Focus: A Guide to AIDS Research and Counseling*. 2005; 20(2):1–4.
- Hoff CH, Beougher SC. Sexual agreements among gay male couples. *Archives of Sexual Behavior*. 2010; 39:774–787. [PubMed: 18686027]
- Hoff CC, Chakravarty D, Beougher SC, Darbes LA, Dadasovich R, Nielsands TB. Serostatus differences and agreements about outside partners among gay male couples. *AIDS Education and Prevention*. 2009; 21:25–38. [PubMed: 19243229]
- Jin F, Crawford J, Prestage GP, Zablotska I, Imrie J, Kippax SC, Grulich AE. Unprotected anal intercourse, risk reduction behaviours, and subsequent HIV infection in a cohort of homosexual men. *AIDS*. 2009; 23:243–252. [PubMed: 19098494]
- Kalichman SC, Eaton L, Cherry C. Sexually transmitted infections and infectiousness beliefs among people living with HIV/AIDS: Implications for HIV treatment as prevention. *HIV Medicine*. 2010; 11:502–509. [PubMed: 20201976]
- Kalichman SC, Pellowski J, Turner C. Prevalence of sexually transmitted co-infections in people living with HIV/AIDS: Systematic review with implications for using HIV treatments for prevention. *Sexually Transmitted Infections*. 2011; 87:183–190. [PubMed: 21330572]
- Kamenga M, Ryder RW, Jingu M, Mbuyi N, Mbu L, Behets F, Heyward WL. Evidence of marked sexual behavior change associated with low HIV-1 seroconversion in 149 married couples with discordant HIV-1 serostatus: Experience at an HIV counselling center in Zaire. *AIDS*. 1991; 5:61–67. [PubMed: 2059362]
- Kelley CF, Haaland RE, Patel P, Evans-Strickfaden T, Farshy C, Hanson D, Hart CE. HIV-1 RNA rectal shedding is reduced in men with low plasma HIV-1 RNA viral loads and is not enhanced by sexually transmitted bacterial infections of the rectum. *Journal of Infectious Diseases*. 2011; 204:761–767. [PubMed: 21844302]
- Kippax S. Negotiated safety agreements among gay men. In: O'Leary, A., editor. *Beyond condoms: Alternative approaches to HIV prevention*. New York: Kluwer/Plenum Publishers; 2002. p. 1–15.
- Kippax S, Crawford J, Davis M, Rodden P, Dowsett G. Sustaining safe sex: A longitudinal study of a sample of homosexual men. *AIDS*. 1993; 7:279–282. [PubMed: 8466693]
- Kippax S, Noble J, Prestage G, Crawford JM, Campbell D, Baxter D, et al. Sexual negotiation in the AIDS era: Negotiated safety revisited. *AIDS*. 1997; 11:191–197. [PubMed: 9030366]
- Kippax S, Slavin S, Ellard J, Hendry O, Ricters J, Grulich A, et al. Seroconversion in context. *AIDS Care*. 2003; 15:839–852. [PubMed: 14617505]
- Kizito D, Woodburn PW, Kesande B, Ameke C, Nabulime J, Muwanga M, Elliott AM. Uptake of HIV and syphilis testing of pregnant women and their male partners in a programme for prevention of mother-to-child HIV transmission in Uganda. *Tropical Medicine and International Health*. 2008; 13:680–682. [PubMed: 18331533]
- Koenig LJ, Lyles C, Smith DK. Adherence to antiretroviral medications for HIV pre-exposure prophylaxis: Lessons learned from trials and treatment studies. *American Journal of Preventive Medicine*. 2013; 44(Suppl. 1):S91–S98. doi:10.1016/j.amepre.2012.09.047. [PubMed: 23253769]
- Krakower DS, Mimiaga MJ, Rosenberger JG, Novak DS, Mitty JA, White JM, et al. Limited awareness and low immediate uptake of pre-exposure prophylaxis among men who have sex with men using an internet social networking site. *PLoS ONE*. 2012; 7(3):e33119. [PubMed: 22470438]
- Kurth AE, Celum C, Baeten JM, Vermund SH, Wasserheit JN. Combination HIV prevention: Significance, challenges, and opportunities. *Current HIV/AIDS Report*. 2010; 8:62–72.

- Landovitz RJ, Combs KB, Currier JS. Availability of HIV postexposure prophylaxis services in Los Angeles County. *Clinical Infectious Diseases*. 2009; 48:1624–1627. [PubMed: 19400685]
- Liu AY, Kittredge PV, Vittinghoff E, Raymond HF, Ahrens K, Matheson T, Buchbinder SP. Limited knowledge and use of HIV post- and pre-exposure prophylaxis among gay and bisexual men. *Journal of Acquired Immune Deficiency Syndrome*. 2008; 47:241–247.
- Margolin G. Ethical and legal considerations in marital and family therapy. *American Psychologist*. 1982; 37:788–801. [PubMed: 7137697]
- Marks G, Millett GA, Bingham T, Lauby J, Murrill CS, Stueve A. Prevalence and protective value of serosorting and strategic positioning among black and Latino men who have sex with men. *Sexually Transmitted Diseases*. 2010; 37:325–327. [PubMed: 20081556]
- Mimiaga MJ, Case P, Johnson CV, Safren SA, Mayer KH. Preexposure antiretroviral prophylaxis attitudes in high-risk Boston area men who report having sex with men: Limited knowledge and experience but potential for increased utilization after education. *Journal of Acquired Immune Deficiency Syndrome*. 2009; 50:77–83.
- Mitchell, J. Attitudes toward new social and biomedical HIV prevention techniques among male couples; Minneapolis, MN. Paper presented at the 2012 National STD prevention conference; 2012 Mar.
- Mutua G, Sanders E, Mugo P, Anzala O, Haberer JE, Bangsberg D, Priddy FH. Safety and adherence to intermittent pre-exposure prophylaxis (PrEP) for HIV-1 in African men who have sex with men and female sex workers. *PLoS One*. 2012; 7(4):e33103. [PubMed: 22511916]
- National Minority AIDS Council. Declaration to end HIV/AIDS in America. 2012. Retrieved from http://nmac.org/wp-content/uploads/2012/10/DeclarationtoEndAIDSInAmerica_FINAL.pdf
- Paltiel AD, Walensky RP. Home HIV testing: Good news but not a game changer. *Annals of Internal Medicine*. 2012; 157:744–746. [PubMed: 23044643]
- Panel on Antiretroviral Guidelines for Adults and Adolescents. Guidelines for the use of antiretroviral agents in HIV-1-infected adults and adolescents. Department of Health and Human Services. 2013. Retrieved from <http://aidsinfo.nih.gov/contentfiles/lvguidelines/adultandadolescentgl.pdf>
- Parsons JT, Severino J, Nanin J, Punzalan JC, von Sternberg K, Missildine W, et al. Positive, negative, unknown: Assumptions of HIV status among HIV-positive men who have sex with men. *AIDS Education and Prevention*. 2006; 18:139–149. [PubMed: 16649959]
- Parsons JT, Starks TJ, DeBois S, Grov C, Golub SA. Alternatives to monogamy among gay male couples in a community survey: Implications for mental health and sexual risk. *Archives of Sexual Behavior*. 2013; 42:303–312. [PubMed: 22187028]
- Parsons JT, Starks TJ, Gamarel KE, Grov C. Non-monogamy and sexual relationship quality among same-sex male couples. *Journal of Family Psychology*. 2012; 26:669–677. [PubMed: 22906124]
- Pequegnat W, Bray JH. HIV/STD prevention interventions for couples and families: A review and introduction to the special issue. *Couple and Family Psychology: Research and Practice*. 2012; 1(2):79–93.
- Pitcher CD, Tien HC, Eron JJ, Vernazza PL, Leu SY, Stewart PW, Cohen MS. Brief but efficient: Acute HIV infection and the sexual transmission of HIV. *Journal of Infectious Diseases*. 2004; 189:1785–1792. [PubMed: 15122514]
- Purcell DW, Johnson CH, Lansky A, Prejean J, Stein R, Denning P, Crepaz N. Estimating the population size of men who have sex with men in the United States to obtain HIV and syphilis rates. *The Open AIDS Journal*. 2012; 6(Suppl. 1):98–107. M6. [PubMed: 23049658]
- Remien RH, Stirratt MJ, Dolezal C, Dognin JS, Wagner GJ, Carballo-Diéguez A, Jung TM. Couple-focused support to improve HIV medication adherence: A randomized controlled trial. *AIDS*. 2005; 19:807–814. [PubMed: 15867495]
- Schechter M, do Lago RF, Mendelsohn A, Moreira RI, Moulton LH, Harrison LH, et al. Behavioral impact, acceptability, and HIV incidence among homosexual men with access to postexposure chemoprophylaxis for HIV. *Journal of Acquired Immune Deficiency Syndromes*. 2004; 35:519–525. [PubMed: 15021317]
- Simmons J, McMahon JM. Barriers to drug treatment for IDU couples: The need for couple-based approaches. *Journal of Addictive Diseases*. 2012; 31:242–257. [PubMed: 22873186]

- Smith K, Powers KA, Kashuba AD, Cohen MS. HIV-1 treatment as prevention: The good, the bad, and the challenges. *Current Opinion in HIV & AIDS*. 2011; 6:315–325. [PubMed: 21646878]
- Smith DK, Toledo L, Smith DJ, Adams MA, Rothenberg R. Attitudes and program preferences of African American urban young adults about pre-exposure prophylaxis (PrEP). *AIDS Education and Prevention*. 2012; 24:408–421. [PubMed: 23016502]
- Spaulding AB, Lifson AR, Iverson ER, Ganesan A, Landrum ML, Weintrob AC. Infectious Disease Clinical Research Program HIV Working Group. Gonorrhoea or chlamydia in a US military HIV-positive cohort. *Sexually Transmitted Infections*. 2012; 88:266–271. [PubMed: 22223813]
- Stephenson R, Sullivan PS, Salazar LF, Gratz B, Allen S, Seelbach E. Attitudes towards couples-based HIV testing among MSM in three US cities. *AIDS and Behavior*. 2011; 15(Suppl. 1):S80–S87. [PubMed: 21336607]
- Su JR, Beltrami JF, Zaidi AA, Weinstock HS. Primary and secondary syphilis among Black and Hispanic men who have sex with men: Case report data from 27 States. *Annals of Internal Medicine*. 2011; 155:145–151. [PubMed: 21810707]
- Sullivan PS, Salazar L, Buchbinder S, Sanchez TH. Estimating the proportion of HIV transmissions from main sex partners among men who have sex with men in five US cities. *AIDS*. 2009; 23:1153–1162. [PubMed: 19417579]
- The Voluntary HIV-1 Counseling and Testing Efficacy Study Group. Efficacy of voluntary HIV-1 counselling and testing in individuals and couples in Kenya, Tanzania, and Trinidad: A randomised trial. *Lancet*. 2000; 356:103–112. [PubMed: 10963246]
- The White House Office on National AIDS Policy. National HIV/AIDS Policy for the United States. 2010. Retrieved from <http://www.whitehouse.gov/sites/default/files/uploads/NHAS.pdf>
- Torrone EA, Bertolli J, Li J, Sweeney P, Jeffries WL, Ham DC, et al. Increased HIV and primary and secondary syphilis diagnoses among young men—United States, 2004–2008. *Journal of Acquired Immune Deficiency Syndromes*. 2011; 58:328–335. [PubMed: 21826012]
- Tripathi A, Ogbuanu C, Monger M, Gibson JJ, Duffus WA. Preexposure prophylaxis for HIV infection: Healthcare providers' knowledge, perception, and willingness to adopt future implementation in the southern US. *Southern Medical Journal*. 2012; 105:199–206. [PubMed: 22475669]
- U.S. Department of Health Human Services. Antiretroviral postexposure prophylaxis after sexual, injection-drug use, or other nonoccupational exposure to HIV in the United States: Recommendations from the U.S. Department of Health and Human Services. *Morbidity and Mortality Weekly Reports Recommendations and Reports*. 2005; 54(RR-2):1–20. Retrieved from <http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5402a1.htm>.
- Wagenaar BH, Christiansen-Lindquist L, Khosropour C, Salazar LF, Benbow N, Prachand N, Sullivan PS. Willingness of U. S. men who have sex with men (MSM) to participate in couples HIV voluntary counseling and testing (CVCT). *PLoS One*. 2012; 7(8):e42953. [PubMed: 22905191]
- Ware NC, Wyatt MA, Haberer JE, Baeten JM, Kintu A, Psaros C, Bangsberg DR. What's love got to do with it? Explaining adherence to oral antiretroviral pre-exposure prophylaxis for HIV-serodiscordant couples. *Journal of Acquired Immune Deficiency Syndromes*. 2012; 59:463–468. [PubMed: 22267018]
- White JM, Mimiaga MJ, Krakower DS, Mayer KH. Evolution of Massachusetts physician attitudes, knowledge, and experience regarding the use of antiretrovirals for HIV prevention. *AIDS Patient Care and STDs*. 2012; 26:395–405. [PubMed: 22694239]
- World Health Organization. Prevention and treatment of HIV and other sexually transmitted infections among men who have sex with men and transgender people: Recommendations for a public health approach 2011. 2011. Retrieved from http://www.who.int/hiv/pub/guidelines/msm_guidelines2011/en/
- World Health Organization. Guidance on couples HIV testing and counselling including antiretroviral therapy for treatment and prevention in serodiscordant couples: A public health approach. 2012. Retrieved from <http://www.who.int/hiv/pub/guidelines/9789241501972/en/>
- Wu E, El-Bassel N, McVinney LD, Hess L, Remien RH, Charania M, et al. Feasibility and promise of a couple-based HIV/STI preventive intervention for methamphetamine-using, black men who have sex with men. *AIDS and Behavior*. 2011; 15:1745–1754. [PubMed: 21766193]

Zablotska IB, Imrie J, Prestage G, Crawford J, Rawstorne P, Grulich A, Kippax S. Gay men's current practice of HIV sero-concordant unprotected anal intercourse: serosorting or seroguessing? *AIDS Care*. 2009; 21:501–510. [PubMed: 19266409]

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Table 1

Biomedical interventions for MSM couples

	TasP	PrEP	nPEP
HIV Discordant ^a	Yes	Yes	Yes
Concordant Negative	No	If not mutually monogamous	If not mutually monogamous
Concordant Positive	Yes	No	No

Note: Couples are self-defined by the men and do not imply any specific relationship status or length of relationship

TasP treatment as prevention, *PrEP* pre-exposure prophylaxis, *nPEP* non-occupational post-exposure prophylaxis

^aCouples with one HIV-positive partner and one partner who is HIV-negative partner or whose HIV status is unknown. PrEP Guidelines indicate that both partners should be tested before initiation of PrEP